

# HP NC380T PCI Express Dual Port Multifunction Gigabit Server Adapter User Guide



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The information contained herein is subject to change without notice. The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

### **Audience assumptions**

This document is for the person who installs, administers, and troubleshoots servers and storage systems. HP assumes you are qualified in the servicing of computer equipment and trained in recognizing hazards in products with hazardous energy levels.

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# Technician notes

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**WARNING:** Only authorized technicians trained by HP should attempt to repair this equipment. All troubleshooting and repair procedures are detailed to allow only subassembly/module-level repair. Because of the complexity of the individual boards and subassemblies, no one should attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs can create a safety hazard.

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**WARNING:** To reduce the risk of electric shock, personal injury, and damage to the equipment:

- Do not attempt to service any parts of the equipment other than those specified in the following procedure. Any other activities may require that you shut down the server and remove the power cord.
  - Installation and maintenance of this product must be performed by individuals who are knowledgeable about the procedures, precautions and hazards associated with the product.
- 



**WARNING:** To reduce the risk of electric shock or damage to the equipment:

- Do not disable the power cord grounding plug. The grounding plug is an important safety feature.
  - Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.
  - Unplug the power cord from the power supply to disconnect power to the equipment.
  - Do not route the power cord where it can be walked on or pinched by items placed against it. Pay particular attention to the plug, electrical outlet, and the point where the cord extends from the server.
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**CAUTION:** To properly ventilate the system, you must provide at least 7.6 cm (3.0 in) of clearance at the front and back of the server.

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**CAUTION:** The server is designed to be electrically grounded (earthed). To ensure proper operation, plug the AC power cord into a properly grounded AC outlet only.

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**NOTE:** Any indications of component replacement or printed wiring board modifications may void any warranty.

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# Where to go for additional help

1. Go to the HP website (<http://www.hp.com>).
2. Click **Software & Driver Downloads** from the left menu bar.
3. Type the product name in the **For product** box and press **Enter**. For example, type NC370T.
4. Download the drivers, firmware, or documentation as needed.

## HP contact information

For the name of the nearest HP authorized reseller:

- In the United States, see the HP US service locator webpage ([http://www.hp.com/service\\_locator](http://www.hp.com/service_locator)).
- In other locations, see the Contact HP worldwide (in English) webpage (<http://welcome.hp.com/country/us/en/wwcontact.html>).

For HP technical support:

- In the United States, for contact options see the Contact HP United States webpage ([http://welcome.hp.com/country/us/en/contact\\_us.html](http://welcome.hp.com/country/us/en/contact_us.html)). To contact HP by phone:
  - Call 1-800-HP-INVENT (1-800-474-6836). This service is available 24 hours a day, 7 days a week. For continuous quality improvement, calls may be recorded or monitored.
  - If you have purchased a Care Pack (service upgrade), call 1-800-633-3600. For more information about Care Packs, refer to the HP website (<http://www.hp.com>).
- In other locations, see the Contact HP worldwide (in English) webpage (<http://welcome.hp.com/country/us/en/wwcontact.html>).

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# Introduction

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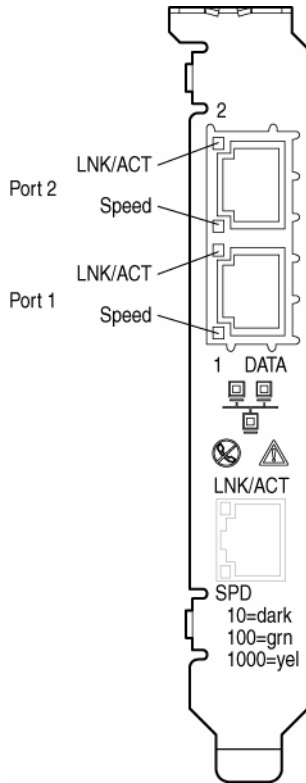
## Overview

The HP NC380T PCI Express Dual Port Multifunction Gigabit Server Adapter is a high-performance, dual port, Ethernet adapter that delivers up to 1000 Mb/s Ethernet over twisted-pair (copper) cabling. The NC380T adapter has a fully integrated controller capable of auto-negotiating a link at 10, 100, or 1000 Mb/s. The network connection is made through an RJ-45 connector. LED indicators show the speed and activity of the link once it has been established. See LED indicators (on page 7) for details.

The NC380T is a supported option for selected HP ProLiant servers. In addition to features that have shipped with other server adapters, the NC380T adapter will also support Receive Side Scaling, TCP/IP Offload Engine (TOE), iSCSI, and Remote Direct Memory Access (RDMA) when those features become available. For details about each of these advanced features and for other information regarding the latest functionality, features, and operating system support for this server adapter, see the HP website (<http://h18004.www1.hp.com/products/servers/networking/index-nic.html>).

# LED indicators

The NC380T adapter has two auto-negotiating 10/100/1000 RJ-45 ports. LED indicators show link/activity and port speed.



LED indicator	Status	Description
<b>LNK/ACT</b>	Off	No link to the adapter is established. The adapter is not receiving power or the cable connection is faulty.
	On	Link to the adapter is established. The adapter is receiving power and the cable connection is good.
	Flashing	The adapter is sending or receiving network data at 10/100/1000 Mb/s as indicated by the 10/100/1000 (speed) LED. The adapter is receiving power and the cable connection is good.
<b>SPD</b>	Off (Dark)	The adapter is sending or receiving network data at 10 Mb/s.
	Green	The adapter is sending or receiving network data at 100 Mb/s.
	Yellow	The adapter is sending or receiving network data at 1000 Mb/s.

## UTP CAT5 cable

The NC380T adapter can use existing UTP CAT5 (or better) cable to deliver Gigabit Ethernet over copper, according to the IEEE 802.3ab specifications. For new installations, CAT5e (enhanced CAT5) cable is recommended. For troubleshooting and other information about cabling, see UTP Cable Specifications (on page [11](#)).



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# Installing an adapter

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## Installation overview

This chapter describes installation precautions, how to install the adapter, and how to connect the network cable.



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**WARNING:** To reduce the risk of personal injury or damage to the equipment, consult the safety information and user documentation provided with the server before attempting the installation.

Many servers are capable of providing energy levels that are considered hazardous and are intended to be serviced only by qualified personnel who have been trained to deal with these hazards. Do not remove enclosures or attempt to bypass any interlocks that may be provided for the purpose of removing these hazardous conditions.

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**WARNING:** Installation of this adapter should be performed by individuals who are both qualified in the servicing of computer equipment, and trained in the hazards associated with products capable of producing hazardous energy levels.

This adapter is intended to be installed in Certified (UL or CSA) ITE equipment having instructions for adding and removing user installed components such as PCI, PCI-X, and PCI Express devices. Refer to the equipment instructions to verify that it is suitable for user installed components and that it has the power capacity to support all of the installed components.

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**NOTE:** Before removing the cover of your server, refer to the HP documentation for the proper methods for installing a PCI card and avoiding electric shock hazards.

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## Preventing electrostatic discharge

To prevent damaging the system, be aware of the precautions you need to follow when setting up the system or handling parts. A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

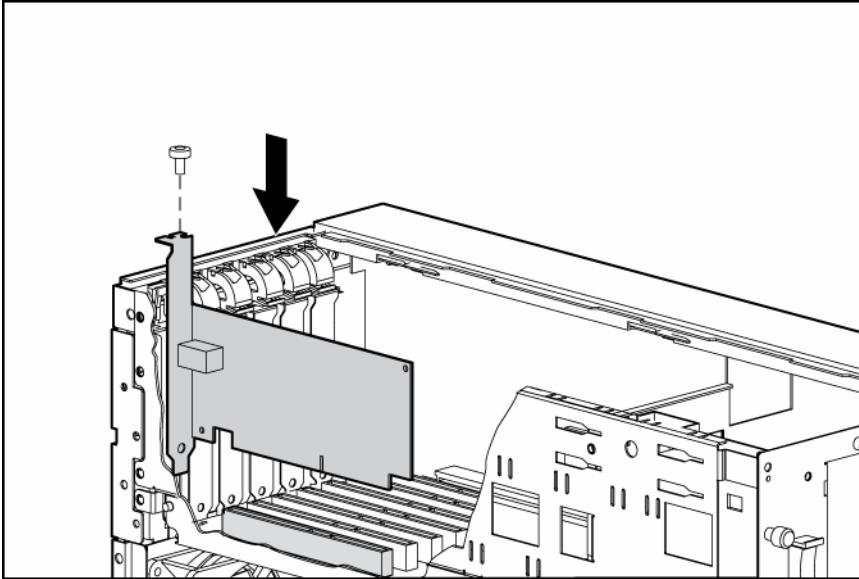
To prevent electrostatic damage:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded surface before removing them from their containers.

- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly.

## Installing an adapter in a server

See the HP ProLiant server documentation for additional information on how to safely install a PCI card in the server.



**⚠ CAUTION:** If the server is not PCI Hot Plug compliant, power it down and unplug the power cord from the power outlet before removing the server access panel. Failure to do so may damage the adapter or server.

1. Power down the server.
2. Remove the power cord and server access panel. Then remove the cover bracket from a PCI Express slot.

**⚠ WARNING:** To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.

3. Firmly seat the adapter in a PCI Express slot and secure the adapter bracket.
4. Replace the access panel and plug in the power cord.

## Connecting the network cable

Network connections for the NC380T adapter can employ existing UTP CAT5 (or better) cable for Gigabit over copper transmissions. For new installations, CATe (enhanced CAT5) or better cable is recommended.

To secure the cable, plug the cable connector into the RJ-45 port. Ensure that the tab on the plug clicks into position indicating that it is properly seated.

For more information, see UTP cable specifications (on page 11).

# Specifications

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## HP NC380T PCI Express Dual Port Multifunction Gigabit Server Adapter specifications

Specification	Value
Network Controller Chipsets	Broadcom 5706C
Bus Type	PCI Express
Bus Width	Four lanes
Bus Speed	2.5 GHz
Data Transfer Method	Bus Master DMA
Power Requirement	Operating Voltage: +12V +/-8% Power Consumption: 12.6 Watts Maximum: 1.05A @ 12V (DC)
Standards Supported	IEEE 802.3ab, 802.3ad, 802.3u, 802.3x, 802.3, 802.1p, 802.1q
Dimensions	18.9 cm x 11.1 cm (without bracket) (7.44 x 4.37 inches (L x W))
Connector and Distances	Two RJ-45 Connectors, Cable and lengths as follows: 10BASE-T: Category 3, 4, or 5 UTP 100 Meters (328 feet) 100BASE-TX: Category 5 UTP 100 Meters (328 feet) 1000BASE-TX: Category 5 UTP 100 Meters (328 feet)
Interrupts Supported	Automatically configured
Temperature Range	Operating: 0°C to 55°C (32°F to 131°F) Storage: -40°C to 85°C (-40°F to 185°F)
Relative Humidity (non-condensing)	Operating: 10% to 90% Storage: 5% to 95%
Safety Compliance	CSA Mark (US and Canada) CE Mark EN 60590

## UTP cable specifications

To connect to the network, the NC380T uses the following cable for 1000Base-T transmission:

- CAT5 UTP or better twisted-pair
- 22-26 AWG, 100Ω @ 1 MHz
- EIA/TIA 568a or EIA/TIA 568b

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**NOTE:** For Gigabit over copper installations, CAT5 UTP or better 1000Base-T cable must comply with the IEEE 802.3ab 1000Base-T standard. For new installations, CAT5e (enhanced CAT5) or better cable is recommended. Maximum distances for Gigabit over copper cable are 100 meters (328 feet).

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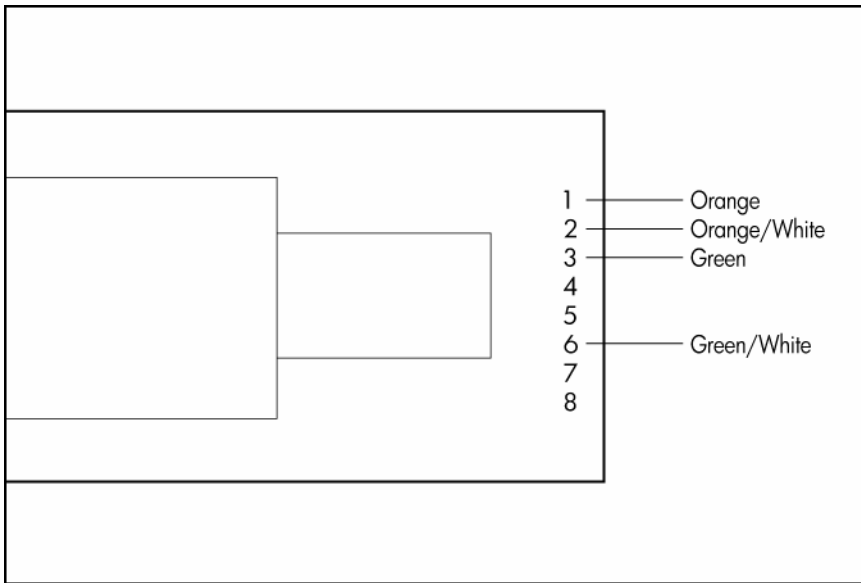
## RJ-45 pinouts and crossover function

The Ethernet standard also specifies that each segment implement a crossover function to connect the transmitter of one device to the receiver of a device at the other end, and vice-versa. The crossover function may be implemented internally at the hub or switch or externally through the twisted-pair media.

### 10/100 pinouts using internal, straight-through crossover

If the crossover function is implemented internally, the port is labeled MDI-X (Medium Dependent Interface-Crossover). When an MDI-X port is connected to an MDI port, the twisted pair media should be wired straight-through using the physical pinouts indicated.

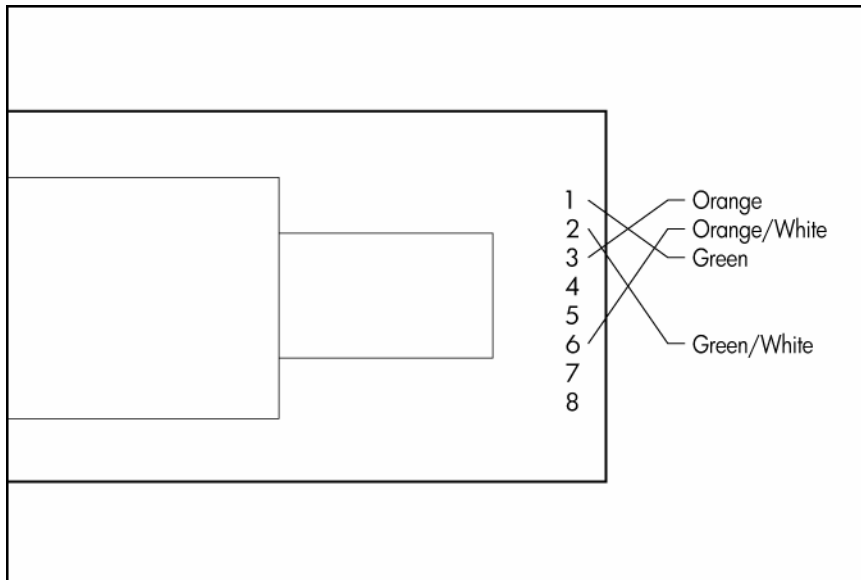
Pin	Function	Color match	Function	Pin
1	TD+	Orange	TD+	1
2	TD-	Orange/White	TD-	2
3	RD+	Green	RD+	3
4		Blue/White		4
5		Blue		5
6	RD-	Green/White	RD-	6
7		Brown		7
8		Brown/White		8



## 10/100 pinouts using external crossover through twisted-pair media

When the crossover function is not provided within the hub or switch, you must implement the crossover through the twisted-pair media using the physical pinouts indicated.

Pin	Function	Color match	Function	Pin
1	TD+	Orange	RD+	3
2	TD-	Orange/White	RD-	6
3	RD+	Green	TD+	1
4		Blue/White		
5		Blue		
6	RD-	Green/White	TD-	2
7		Brown		
8		Brown/White		

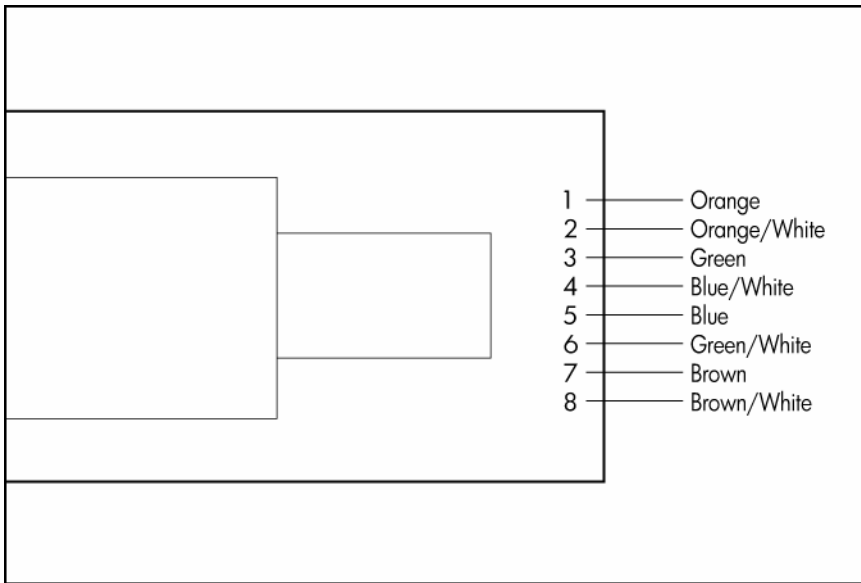


## Gigabit over copper pinouts using internal crossover for RJ-45

Unlike connections in which the crossover function is implemented internally at the hub or switch, the NC380T provides its own automatic crossover function. This means you can wire twisted-pair media straight-through for adapter-to-hub, adapter-to-switch, or adapter-to-adapter connections using the pinouts indicated.

**NOTE:** To operate at Gigabit speeds, all four pairs of wires must be terminated within the RJ-45 connector.

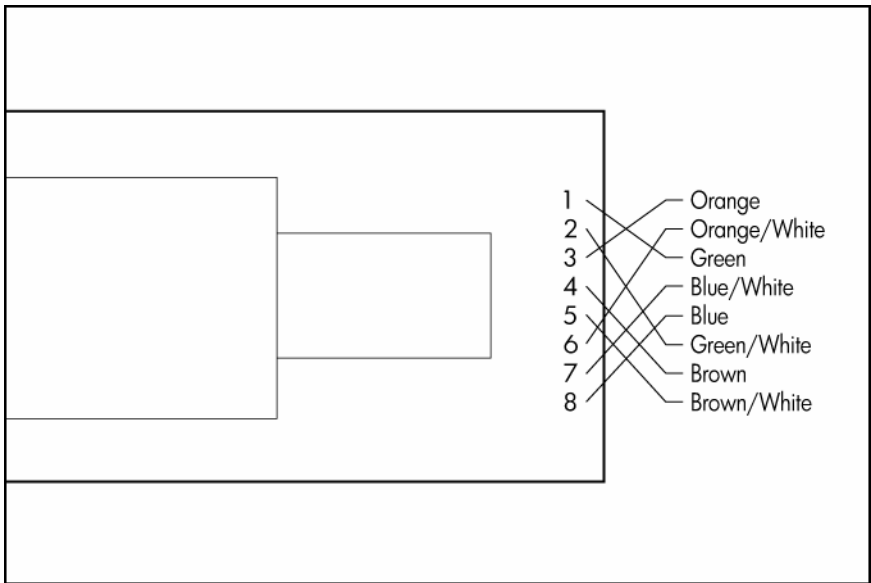
Pin	Function	Color match	Function	Pin
1	BI_DA+	Orange	BI_DA+	1
2	BI_DA-	Orange/White	BI_DA-	2
3	BI_DB+	Green	BI_DB+	3
4	BI_DC+	Blue/White	BI_DC+	4
5	BI_DC-	Blue	BI_DC-	5
6	BI_DB-	Green/White	BI_DB-	6
7	BI_DD+	Brown	BI_DD+	7
8	BI_DD-	Brown/White	BI_DD-	8



## Gigabit over copper pinouts using external crossover through twisted pair media

When a crossover function is not provided by the adapter, hub or switch, you must implement it through the twisted-pair media using the physical pinouts indicated.

Pin	Function	Color match	Function	Pin
1	BI_DA+	Orange	BI_DB+	3
2	BI_DA-	Orange/White	BI_DB-	6
3	BI_DB+	Green	BI_DA+	1
4	BI_DC+	Blue/White	BI_DD+	7
5	BI_DC-	Blue	BI_DD-	8
6	BI_DB-	Green/White	BI_DA-	2
7	BI_DD+	Brown	BI_DC+	4
8	BI_DD-	Brown/White	BI_DC-	5





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## Regulatory compliance identification numbers

For the purpose of regulatory compliance certifications and identification, this product has been assigned a unique regulatory model number. The regulatory model number can be found on the product nameplate label, along with all required approval markings and information. When requesting compliance information for this product, always refer to this regulatory model number. The regulatory model number is not the marketing name or model number of the product.

## Federal Communications Commission notice

Part 15 of the Federal Communications Commission (FCC) Rules and Regulations has established Radio Frequency (RF) emission limits to provide an interference-free radio frequency spectrum. Many electronic devices, including computers, generate RF energy incidental to their intended function and are, therefore, covered by these rules. These rules place computers and related peripheral devices into two classes, A and B, depending upon their intended installation. Class A devices are those that may reasonably be expected to be installed in a business or commercial environment. Class B devices are those that may reasonably be expected to be installed in a residential environment (for example, personal computers). The FCC requires devices in both classes to bear a label indicating the interference potential of the device as well as additional operating instructions for the user.

## Class A equipment

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the

instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at personal expense.

## Class B equipment

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit that is different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or television technician for help.

## Declaration of conformity for products marked with the FCC logo, United States only

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For questions regarding this product, contact us by mail or telephone:

- Hewlett-Packard Company  
P. O. Box 692000, Mail Stop 530113  
Houston, Texas 77269-2000
- 1-800-HP-INVENT (1-800-474-6836). (For continuous quality improvement, calls may be recorded or monitored.)

For questions regarding this FCC declaration, contact us by mail or telephone:

- Hewlett-Packard Company  
P. O. Box 692000, Mail Stop 510101  
Houston, Texas 77269-2000
- 1-281-514-3333

To identify this product, refer to the part, series, or model number found on the product.

## Modifications

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by Hewlett-Packard Company may void the user's authority to operate the equipment.

## Cables

Connections to this device must be made with shielded cables with metallic RFI/EMI connector hoods in order to maintain compliance with FCC Rules and Regulations.

## Canadian notice (Avis Canadien)

### **Class A equipment**

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

### **Class B equipment**

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

## European Union regulatory notice



This product complies with the following EU Directives:

- Low Voltage Directive 2006/95/EC
- EMC Directive 2004/108/EC

CE Compliance of this product is valid only if powered with the correct HP-provided and CE marked AC adapter.

If this product has telecommunication functionality, it also complies with the essential requirements of:

- R&TTE Directive 1999/5/EC



\*For a notified body number refer to the product regulatory label.

Compliance with these directives implies conformity to harmonized European standards (European Norms) which are listed on the EU Declaration of Conformity issued by Hewlett-Packard for this product or product family.

The telecommunications functionality of this product may be used in the following EU and EFTA countries:

Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, and United Kingdom.

### **Notice for use in France and Italy**

#### **Italy:**

Per l'uso del prodotto, è necessaria una concessione ministeriale. Si consiglia di verificare con il distributore di fiducia o direttamente presso la Direzione Generale Pianificazione e Gestione Frequenze.

License required for use. Verify with your dealer or directly with General Direction for Frequency Planning and Management (Direzione Generale Pianificazione e Gestione Frequenze).

#### **France:**

L'utilisation de cet équipement (2.4GHz Wireless LAN) est soumise a certaines restrictions: Cet équipement peut être utilisé à l'intérieur d'un bâtiment en utilisant toutes les fréquences de 2400 à 2483.5MHz (Chaîne 1-13). Pour une utilisation en environnement extérieur, vous devez utiliser les fréquences comprises entre 2454-2483.5MHz (Chaîne 10-13). Pour les dernières restrictions, voir <http://www.art-telecom.fr>.

For 2.4 GHz Wireless LAN operation of this product certain restrictions apply: This product may be used indoor for the entire 2400-2483.5 MHz frequency band (channels 1-13). For outdoor use, only 2454-2483.5 MHz frequency band (channels 10-13) may be used. For the latest requirements, see <http://www.art-telecom.fr>.

### **Notice for products incorporating 5GHz Wireless LAN devices**

Frequency availability for 802.11a or 802.11h Wireless LAN is not currently harmonized throughout the European Union. For compliance requirements, users should verify with their supplier, local HP office or Telecommunications authority.

Hewlett-Packard GmbH, HQ-TRE, Herrenberger Strasse 140, 71034 Boeblingen, Germany

## Japanese notice

ご使用になっている装置にVCCIマークが付いていましたら、次の説明文をお読み下さい。

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。取扱説明書に従って正しい取り扱いをして下さい。

VCCIマークが付いていない場合には、次の点にご注意下さい。

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

## Korean class A notice

### A급 기기 (업무용 정보통신기기)

이 기기는 업무용으로 전자파적합등록을 한 기기이오니 판매자 또는 사용자는 이 점을 주의하시기 바라며, 만약 잘못판매 또는 구입하였을 때에는 가정용으로 교환하시기 바랍니다.

## Korean class B notice

### B급 기기 (가정용 정보통신기기)

이 기기는 가정용으로 전자파적합등록을 한 기기로서 주거지역에서는 물론 모든지역에서 사용할 수 있습니다.

## BSMI notice

### 警告使用者:

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

## Disposal of waste equipment by users in private households in the European Union



This symbol on the product or on its packaging indicates that this product must not be disposed of with your other household waste. Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or the shop where you purchased the product.

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# Electrostatic discharge

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## Overview

To prevent damaging the system, be aware of the precautions you need to follow when setting up the system or handling parts. A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

To prevent electrostatic damage:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.

Always be properly grounded when touching a static-sensitive component or assembly.

## Grounding methods to prevent electrostatic discharge

Several methods are used for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

- Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm  $\pm 10$  percent resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.
- Use heel straps, toe straps, or boot straps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.
- Use conductive field service tools.
- Use a portable field service kit with a folding static-dissipating work mat.

If you do not have any of the suggested equipment for proper grounding, have an authorized reseller install the part.

For more information on static electricity or assistance with product installation, contact an authorized reseller.

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# Acronyms and abbreviations

## ACPI

Advanced Configuration and Power Interface

## APM

advanced power management

## CSA

Canadian Standards Association

## DMA

direct memory access

## IEEE

Institute of Electrical and Electronics Engineers

## iSCSI

Internet Small Computer System Interface

## MDI-X

medium dependent interface-crossover

## NIC

network interface controller

## PCI

peripheral component interface

## PCI Express

Peripheral Component Interconnect Express

## PCI-X

peripheral component interconnect extended

## RDMA

Remote Direct Memory Access

RSS

Receive-Side Scaling

TOE

TCP/IP Offload Engine

UTP

unshielded twisted pair



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